Most of us have done some volunteer work since Sandy. This editor donated at day at the Modern Museum of Art’s Collections Salvage Information and Workshop, Sunday, November 4th. Since then I’ve been listed as a resource on their website to provide help to artists, museums, collectors, and other people who need to rescue damaged art works and studio spaces. I’ve also done two WNYC radio interviews, one on general abatement issues and the other on mold. As a result, I’ve been answering e-mails and calls from people with storm-related safety issues.

This data sheet is written in response to many of these calls. It is especially intended to prevent the kinds of health damage to clean up workers we saw after both 9/11 and hurricane Katrina. We are seeing the same mistakes being made. People are cleaning up their homes and businesses without any training about the hazards or proper protective gear. Equally inexperienced, ill-equipped volunteers are helping them. Many of these people can be expected to have health problems later.

WHY THE SAME MISTAKES? While some people remember the lessons from 9/11, there are still well-meaning New Yorkers and outside volunteers who think it is admirable to step in to help people without proper training. Worse, there are still uneducated press reporters who glorify them. The most upsetting articles are about religious organizations whose volunteers include children. In my opinion, the reporters whose articles encourage these misguided parents are culpable.

There also are large numbers of immigrant laborers. Those lucky enough to land temporary work for FEMA or other government agencies are reportedly issued protective equipment and trained. But there are others working for private employers in ways almost guaranteed to put them at risk.

Then there are the individual home owners, owners of very small businesses, and artists trying to rehabilitate their own homes, stores and studios. Those without financial resources and good insurance policies have few options other than to do their own work. We saw some of these individuals and small communities work together after Katrina, too.

This data sheet is for all of these groups and individual workers and contains some of the basic information they need to protect themselves and others during flood clean up and remediation.
AFTER THE DISASTER: CLEANING UP YOUR HOME, STORE OR STUDIO

ACTS data sheet, last revision: 12/12/12

FIRST RULE: Do not do this work if you have health problems such as heart or lung problems, you are pregnant, or if you have allergies to mold. Air purifying respirators are not protective enough to prevent allergic reactions. You can seriously harm your health by doing this work. And children’s health can be impacted by this work and must NEVER be involved.

SECOND RULE: Keep firmly in mind that you are not a qualified flood abatement worker. This means you should not do this work if you have access to any other source of money such as from insurance from which to hire a proper contractor. If lead paint or asbestos is present, this work is too hazardous for you. You need to find some way to hire a certified abatement contractor. Hiring a contractor is also in your own interest, since their contract usually make it possible to recover damages if the job is done poorly or they damage your property.

LAB TESTS. If your home, studio or building was erected before 1980, you need to know for certain whether or not lead and/or asbestos are present. You can hire a technician from an abatement company or a certified lab to take samples and provide the test results a day or two. If the tests show that lead and asbestos are not present, then mold and sewerage pathogens are the primary hazards.

MOLD. If there is obvious thick mold growth throughout, this also is not a job you should tackle. While it is not illegal for a property owner or volunteer to do this work, it is foolish and dangerous. If the mold is not extensive, you may be able to do the work. Some experts say that if the total area of mold in any single room is less than about four square feet, it can be done with simple precautions such as a respirator (see data sheet below) and protective gloves and clothing.

I also have seen Sandy-damaged properties recently that were kept open to the outside air and dried with fans in which visible mold was not seen. This can happen because the local temperatures have been cold and on most days the humidity was low--conditions under which mold does not thrive. However, these buildings must be abated anyway since they will mold eventually. It is most likely to happen in summer when the humidity is high. It will happen because the flood water contained enough nutrients for those walls and insulation to function like a petrii dish when conditions are right. This storm surge water contained contaminants from wastewater treatment plants, sewer overflows, vessel sewerage discharge, City street runoff containing offal from pets, oil spills, more.

The storm surge also may have stirred up sediments in rivers and bays around the city which are full of chemicals and toxic metals. The sediments from the Hudson river also contain PCBs.

MOLD IDENTIFICATION. Identification of the types of molds is interesting, but not very helpful. The tests I’ve been seeing show Aspergillus is most abundant with lesser amounts of other species of molds, smuts, and rusts. But you can be sure every mold and it's brother is in that mess or in the air somewhere and ready to take up residence. Mold tests are most useful when people have developed allergies and need to know the types of molds to which they react.

Identification of mold might also be necessary when mold is growing abundantly on surfaces all through the building to determine if certain highly toxic molds are present. Whether toxic or not, abundant mold growth usually means the entire interior of the building must be gutted. And this should be done by trained abatement workers.
TESTS FOR WET WALLS. If you have no observable or very limited mold growth, there are two tests that can be done to help you do a good job. These are:

1. **Wipe samples from the floors to test for *coliform* and *e-coli* bacteria.** These are tests for fecal bacteria. The bacteria themselves are not a great threat. You should be able to tolerate minor exposure to them if you are in good health (and are not pregnant), if:

   * the bacteria do not contaminate your food,
   * you wear gloves or have only brief skin contact before washing,
   * you do not expose cuts or breaks in your skin to them, and
   * inhalation of bacteria-laden dust from renovation work is prevented by wearing a respirator.

The presence of the bacteria, however, tells contractors where the contaminated water has been and indicates that many other infectious organisms and toxic substances are also present.

While you can survive exposure with good hygiene, this water is fatal to porous materials such as wall board, insulation, particle board, wall-to-wall carpet, upholstered furniture, mattresses, and more. The dirty water will turn porous materials into richly fertilized gardens for mold. Even if you disinfect and kill the mold, the air is full of molds that can land on this material and thrive on it when conditions are right. The contaminated materials must be removed as soon as possible.

2. **Moisture meter readings.** These should have been taken within a few weeks of the flood. After the walls are dry, moisture meters will not show how high up this water has wicked up into porous materials. Flood lines on materials and fecal bacteria tests only tell you how high the water rose. But you also need to know where that water went inside the materials and walls.

WHERE TO CUT? The two tests above indicate how much porous building material must be cut out and removed. If you cannot afford to have tests done, err on the side of caution. Remove several inches above the water line and watch for dampness in insulation and materials behind the wall board which may have wicked water up higher. Anything suspected to have been wet must go.

Sometimes, studs and beams can be dried out and disinfected. It depends on how long water was in contact with the wood. These decisions are best made by abatement contractors or other experts.

DISINFECTING. Hard surfaces often can be simply cleaned and disinfected. Some bad advice has been given by well-meaning people regarding use of natural and nontoxic disinfectants. But this is a time to employ something that will work. One good cheap disinfectant is a solution of one part household bleach diluted with ten parts of water. It will kill EVERYTHING—molds, bacterial, and all. To use it safely, keep doors and windows open and drying fans in the area. If you will be living or sleeping in a flood damaged building or may have brought contaminants into living areas, wipe down all surfaces. NEVER eat or drink while working. Leave the area and clean up first.

PERSONAL PROTECTIVE EQUIPMENT DURING CLEAN UP.

* Gloves such as nitrile plastic examining gloves.
* Tyvek® coveralls and booties if possible.
* Goggles that seal to the face to protect from both dust and bleach. If you order them from a safety company, they should be rated for chemical splash, dusts, and impact.
* Steel toed shoes (everyone doing construction jobs should have a pair).

HYGIENE. When returning to areas in which you are living and sleeping, make sure to bag soiled work clothes and shower immediately. Do not track Sandy contaminants into these spaces.
When a disaster strikes, experience shows that volunteers and home owners will begin cleaning up flood and storm damaged properties. No amount of warnings will deter these people from trying to do this dusty hazardous work. Yet these people usually are not medically certified, fit tested or trained to wear respirators properly. As a result we can expect to see the same respiratory illnesses after each disaster. This data sheet provides basic information about a commonly used dust mask, N95, to try to improve the effectiveness of this equipment among untrained workers.

If you are an employee paid to do clean up work, this data sheet does not apply to you. You come under OSHA (the Occupational Safety & Health Administration). OSHA defines the N95 as a filtering facepiece "respirator" and your employer must provide services which usually include medical certification, fit testing, and training. If this is not done, you or a fellow worker should call the OSHA regional office. They can act on your complaint without revealing your name.

This data sheet is for people who do not come under the OSHA regulations such as volunteers, artists or home owners cleaning up their studios or homes. Even if you do not come under OSHA, you should understand why OSHA requires the following three conditions for wearing respirators.

1. **Medical certification** means a health professional certifies that you have no medical condition that would be made worse by the breathing stress that respirators cause. For instance, if you have asthma, heart problems, or are pregnant, it may be harmful to you to wear a respirator. And if you have significant allergies to mold, there is no air-filtering respirator that can insure your safety.

2. **Fit testing** is a procedure done by a person qualified to use an approved method to insure the mask fits properly. Fit testing also identifies those people whose faces do not conform to the masks' shape. These people simply cannot be protected by wearing the mask. Fit testers also are not allowed to test people with facial hair (beards) since masks require skin contact in order to seal properly.

3. **Training.** Without training people can misuse their equipment. For example, training for an N95 includes learning that the mask must be discarded after 8 hours of use, that it will only protect you against particles such as dust particles and mold but will let volatile cleaning chemicals through, that the mask must be put on and the straps placed in a particular way to work properly, and more.

A recent hospital study showed that 60% of the medical personnel wearing N95 masks who were not fit tested and trained were not being protected by the masks they wore. If you plan to wear a mask for more than a few days, we recommend you contact Mt. Sinai Hospital's Occupational Medical Clinic for these services. Call us at 212-777-0062 for a referral.

**GENERAL INFORMATION.** When properly used, the N95 can mean the difference between remaining healthy and being sick from the pollution and mold associated with flood water clean up.

1. First be sure you have the right mask by looking for "NIOSH" and the N95 rating on the mask.

2. The N95 has two straps. All of the single strap masks are not suitable for this work.

3. The N95 will only filter out particles such as dusts and molds. Other substances go right through the mask including the volatile chemicals emitted by bleach, ammonia, solvents and other cleaners or engine exhaust. The N95 captures spores and dust from mold. But the odors molds make (which are volatile chemicals to which some people are allergic) go through the N95.
4. The N95 will not provide proper protection against highly toxic dusts such as asbestos and lead. Lead paints and asbestos or asbestos-containing vermiculite insulation were used in older homes.

5. The N95 will not protect you from infections from sewerage bacteria or exposure to toxic substances in flood water by skin contact or ingestion. Wear gloves or wash up regularly during work and before eating, remove and bag contaminated clothing at the door of your home, shower immediately, and launder clothing daily.

PUTTING ON THE MASK.

* Place the N95 on your face so that the foam rests on your nose. Hold the bottom securely under your chin. Pull the top strap over your head and position it high on the back of the head. Then pull the bottom strap over your head and position it around the neck and below the ears. Adjust for a comfortable fit by pulling top panel toward the bridge of the nose and the bottom under chin.

* Place your fingertips from both hands at the top of the metal nosepiece. Using two hands, mold the nose area to the shape of your nose by pushing inward while moving your fingertips down both sides of the nosepiece. (Pinching the nosepiece using one hand may result in improper fit and less effective respirator performance. Use two hands.)

* Fit check: cover the mask as much as possible and breath out hard to detect leaks. (NOTE: this fit check is not the same as a fit test which requires special equipment.)

USE COMMON SENSE. Listen to your body. Don’t work when you are exhausted, hungry, thirsty or sick. Leave contaminated areas immediately if dizziness, irritation, or other distress occurs, or if you smell strong odors. If you have delayed or continuing symptoms like shortness of breath or persistent cough, seek medical attention and do not return to the environment which may have caused the problems.

CAN MOLD TOXINS PENETRATE THE SKIN?

SOURCE. “Human Skin Penetration of Selected Model Mycotoxins.” Jente Boonena, Svetlana V. Malyshevb, Lien Taeverniera, José Diana Di Mavungub, Sarah De Saegerb, Bart De Spiegeleerab, Toxicology, Vol. 301; Issue 1-3, (November 15, 2012) p. 21-32

Mold creates toxic substances when it grows called mycotoxins. There are very few studies of skin contact hazards from mycotoxins even though people in certain professions are exposed to them regularly. A recent study published in Toxicology (see source above) studied how fast six mycotoxins penetrated human skin (in vitro diffusion cell). These were aflatoxin B1 (AFB1), ochratoxin A (OTA), fumonisin B1 (FB1), citrinin (CIT), zearalenone (ZEA) and T-2 toxin (T-2).

OTA showed the highest permeation, followed by CIT. AFB1 and ZEA respectively. T-2 was found to have the lowest permeability. From literature-based mycotoxin-concentrations, dermal contact surface, exposure time and the absorption through the skin (transdermal kinetics) developed in this study, the daily dermal exposure in two industrial and one residential scenario was estimated.

Dermal exposure to the DNA-reactive genotoxic carcinogenic AFB1 was determined to be a health risk for agricultural workers which are exposed to a mycotoxin contaminated solution in a worst case situation. For all the other investigated mycotoxins, no significant health risk is calculated after dermal contact in neither agricultural nor residential environments.